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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/648,064

08/26/2003

Jean R. Chang

TUC920030104US1

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7590

07/14/2006

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EXAMINER

MYINT, DENNIS Y

ART UNIT

PAPER NUMBER

2162

DATE MAILED: 07/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/648,064

Applicant(s)

CHANG ET AL.

Examiner

Dennis Myint

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— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 30 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3-7 and 9-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7 and 9-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This communication is responsive to Applicant's Amendment, filed on 30 May 2006.
2. Examiner expresses thanks for presenting Applicant's remarks in substantially the same order in which the corresponding issues were raised in the first Office Action.
3. Claims 1, 3-7, and 9-20 are pending in this application. Claims 1, 7, and 15 are independent claims. In the Amendment filed on 30 May 2006, claims 1, 2, 5, 7, 9, and 14-20 were amended. Claims 2 and 8 were cancelled. This office action is made final.

### ***Response to Arguments***

4. Applicant's arguments filed on 30 May 2006 have been fully considered but they are not persuasive.

Referring to claim 1, Applicants argue that *Gelb teaches selecting data storage while the present invention claims a dataset directed to magnetic tape data storage* (Applicant's argument, Page-9). In response, Applicant is pointed out that Gelb does teach magnetic tapes, which is one kind of data storage out of a plurality of data storage devices, which the method and system of Gelb chooses depending on the characteristics of the input data sets. Please see Column 12 Lines 64 through Column 13 Lines 15-23, which is a listing of *STORAGE CLASS ACS ROUTINE*, wherein tape

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drives are specified as */\* EXCLUDE NON DASD AND NON TAPE ALLOCATIONS \*/*.

Also note Column 16 Lines 65-68, wherein tape drives are disclosed as *Level two of the hierarchy can include directed tape subsystem(s) 48 or buffered tape subsystem(s) 49*.

Applicant also argues that *neither Gelb nor Basham nor Bergsten teach receiving a dataset from an application that does not support scaling* (Applicant's argument, Page-9). In response, Applicant is pointed out that tape scaling is disclosed by Basham (Figure 8 and Column 14 Line 1 through Column 15 Line 39), as cited in the prior office action. The method and system of Basham accepts input data and scales tape capacity only because applications, which sent input data to the method and system of Basham, did not perform tape scaling in advance. In other words, it is inherent that the method and system of Basham accepts input data from applications that does not support scaling.

Applicant additionally argues that *The present invention further claims selecting a storage instruction comprising a scaling instruction to scale the tape storage medium to a predefined capacity for optimal data access performance. In contrast, Gelb does not teach scaling or selecting scaling storage instructions. Basham does not teach selecting scaling to support data access performance* (Applicant's argument, Page-9). In response, it is pointed out that Basham does teach selecting scaling to support data access performance. Particularly note Column 3 Lines 68-61 which recites that *Until the tape is filled, future data may be stored by creating additional partitions as described above, each partition having a variable size appropriate to the amount of data stored therein*; Column 11 Lines 25-30 which recites that *an application may require assorted*

*sizes of fixed-size partitions, each partition including one or more adjacent segments, as required by the application; and Column 11 Lines 33-36 which recites that As an example, partition sizes may be established by receiving user input (now shown) prior to tasks 502 and 604.*

Even further, Basham teaches *Flexible-Capacity Scaling* from Column 14 Line 1 through Column 15 Line 39. Particularly note Column 14 Lines 38-43, Column 14 Line 64 through Column 15 Line 6, and Column 15 Lines 16-39, wherein it is recited that *Alternatively, a greater or lesser number of partitions may be included in each serpentine swath. For example, each swath may include two or three partitions. To illustrate a specific example, a tape may be defined with 5/2 segments where direction reversals occur after every fourth segment; in this example, each swath includes form partitions. Increasing the number of segments in each serpentine swath may be advantageous in some applications, such as those applications having a fine segment granularity; in these cases, having longer swaths helps to maintain desirable read/write performance, which may otherwise be restricted by a large number of reversals in tape path direction. Furthermore, partitioning with flexible-capacity scaling may be fixed or variable, employing the teachings provided above (and Column 15 Lines 16-39).*

Lastly, Applicant argues that *Applicants further assert that the teaching or suggestion to combine the allocation storage based on classes and groups of Gelb and the scaling of Basham can only be found in the Applicant's disclosure (Applicant's argument Page-10).* In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that

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any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 1, 3-6, 9-10, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gelb et al., (hereinafter "Gelb") (U.S. Patent Number 5018060) in view of Basham et al. (hereinafter "Basham")(U.S. Patent Number 5757571).

Referring to claim 1, Gelb et al. is directed to a system and method for selecting storage media to improve data access performance and teaches the limitations:

“a reception module configured to receive a dataset from an application that does not support scaling for storage on a magnetic tape storage medium (Figure 4: *Data Facility Product 32, Peripheral Data Storage 12*; Column 18 Line 47 through Column 19 Line 59; Column 12 Lines 64 through Column 13 Lines 15-23; and Column 16 Lines 65-68); and

“an identification module configured to identify storage characteristics of the dataset” (Figure 4: *Data Facility Product 32 and Column 19 Lines 16-39, i.e. The parameters in MGMTCLAS ACS ROUTINE are compared with the received data set parameters for determining a best comparison which indicates which of the management classes listed above is selected for the data set.*).

Gelb also teaches a storing module (Figure 4: *Data Facility Product 32*) which stores the data set a storage medium (Figure 4: *Peripheral Data Storage 12*) according to the storage characteristics of the data set (i.e. *received data set parameters*).

Gelb does not explicitly disclose the limitation: “a scaling module configured to select a storage instruction in response to storage criteria applied to the storage characteristics, wherein the storage instruction comprises an instruction to scale the magnetic tape storage medium to a predetermined capacity for optimal data access performance”.

Basham teaches the limitation:

“a scaling module configured to select a storage instruction in response to storage criteria applied to the storage characteristics, wherein the storage instruction comprises an instruction to scale the magnetic tape storage medium to a predetermined



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capacity for optimal data access performance” (Column 3 Lines 68-61, Column 11 Lines 25-30, Column 14 Lines 38-43, Column 14 Line 64 through Column 15 Line 6, and Column 15 Lines 16-39. Particularly note Column 3 Lines 68-61 which recites that *Until the tape is filled, future data may be stored by creating additional partitions as described above, each partition having a variable size appropriate to the amount of data stored therein*; Column 11 Lines 25-30 which recites that *an application may require assorted sizes of fixed-size partitions, each partition including one or more adjacent segments, as required by the application*; and Column 11 Lines 33-36 which recites that *As an example, partition sizes may be established by receiving user input (now shown) prior to tasks 502 and 604*).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to the feature of storage medium scaling as taught by Basham et al. to the system and method of taught for selecting storage media to improve data access performance taught by Gelb et al. so that the resultant system would constitute an apparatus for selecting storage media scaling to improve data access performance, wherein the storing module (Gelb, Figure 4: *Data Facility Product 32*) would be performing the functions of the reception module, identification module, and scaling module of the claimed invention. One would have been motivated to do so in order to *more efficiently and conveniently locate, read, write, and update data stored on magnetic tape media* (Basham, Column 2, Line 47-49) “.

Referring to claim 3, Gelb teaches the limitation:

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“wherein the storage instruction comprises an instruction to not scale the magnetic storage medium” (Column 19 Line 16-58). In the apparatus of Gelb in view of Basham, storage instructions could be to save the data set in the storage medium without scaling the storage medium, that is, without calling the scaling routine taught by Basham et al. (Gelb, Column 19 Line 16-58).

Referring to claim 4, Gelb teaches the limitation:

“further comprising a determination module (Figure 4: *Data Facility Product 32*) configured to store a plurality of predefined storage criteria and compare the storage characteristics of the received dataset with the predefined storage criteria to determine the storage instruction” (Column 12 Lines 43-61, i.e., *storage classes* and”, and Column 18 Line 47 through Column 19 Line 15, i.e., *compare the information*).

Referring to claim 5, Gelb in view of Basham teaches the limitation:

“further comprising a mapping module (Gelb, Figure 4: *Data Facility Product 32*) configured to track capacity information for the storage medium that stores the dataset (Basham, Column 13 Lines 43-67, i.e., *automated padding*). Note that the system of Basham tracks the capacity of the storage medium and such feature could be combined into the *Data Facility Product* of the system of Gelb.

Referring to claim 6, Gelb teaches the limitation:

“wherein the scaling module is configured to communicate the selected instruction to a storage medium controller” (Figure 4: *Data Facility Product 32*, i.e., the storing module, and Figure 4: *IOS 37*).

Claim 9 is rejected on the same basis as claim 3.

Claim 10 is rejected on the same basis as claim 4. Note that the storing module (Gelb, Figure 4: *Data Facility Product 32*) would be performing the functions of the reception module, identification module, and scaling module of the claimed invention.

Claim 15 is rejected on the same basis as claim 4 (Gelb, Column 4 Lines 25-27, i.e., (*Machine-effected method of the invention, ....* ).

Referring claim 16 Gelb teaches the limitation:

“wherein the method further comprises defining a plurality of storage characteristics as storage characteristics that require on optimally scaled magnetic tape storage medium” (Column 8 Line 20-62). Gelb in view of Basham discloses the claim limitation. Specifically note that, in the apparatus/system of Gelb in view of Basham storage characteristics are defined for different levels of capacity, access mode, and performance (Gelb, Column 8 Line 20-62, i.e., *Storage classes and their service attributes*) and storage medium could be scaled as necessary employing the scaling method taught by Basham. Therefore, the method and system of Gelb in view of

Basham further comprises defining a plurality of storage characteristics as storage characteristics that either require storage on optimally scaled storage medium or satisfy storage criteria for storing the dataset on optimally scaled storage medium.

Referring to claim 17, Gelb in view of Basham teaches the limitation:

“wherein the method further comprises defining a plurality of storage characteristics as storage characteristics that require storage on maximum capacity magnetic tape storage medium” (Column 8 Line 20-62). Gelb in view of Basham discloses the claim limitation. Specifically note that, in the apparatus/system of Gelb in view of Basham storage characteristics are defined for different levels of capacity, access mode, and performance (Gelb, Column 8 Line 20-62, i.e., *Storage classes and their service attributes*) and storage medium could be scaled as necessary employing the scaling method taught by Basham. Therefore, the method and system of Gelb in view of Basham further comprises defining a plurality of storage characteristics as storage characteristics that either require storage on optimally scaled storage medium or satisfy storage criteria for storing the dataset on optimally scaled storage medium.

Referring to claim 18, Gelb in view of Basham teaches the limitation:

“wherein determining further comprises identifying storage characteristics that satisfy storage criteria for storing the dataset on optimally scaled magnetic tape storage medium (Column 8 Line 20-62). Specifically note that, in the apparatus/system of Gelb in view of Basham storage characteristics are defined for different levels of capacity,

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access mode, and performance (Gelb, Column 8 Line 20-62, i.e., *Storage classes and their service attributes*) and storage medium could be scaled as necessary employing the scaling method taught by Basham. Therefore, the method and system of Gelb in view of Basham further comprises defining a plurality of storage characteristics as storage characteristics that either require storage on optimally scaled storage medium or satisfy storage criteria for storing the dataset on optimally scaled storage medium.

Referring to claim 19, Gelb in view of Basham teaches the limitation:

“wherein determining further comprises identifying storage characteristics that satisfy storage criteria for storing the dataset on maximum capacity magnetic tape storage medium” (Column 8 Line 20-62). Specifically note that, in the apparatus/system of Gelb in view of Basham storage characteristics are defined for different levels of capacity, access mode, and performance (Gelb, Column 8 Line 20-62, i.e., *Storage classes and their service attributes*) and storage medium could be scaled as necessary employing the scaling method taught by Basham. Therefore, the method and system of Gelb in view of Basham further comprises defining a plurality of storage characteristics as storage characteristics that either require storage on optimally scaled storage medium or satisfy storage criteria for storing the dataset on optimally scaled storage medium.

Claim 20 is rejected on the same basis as claim 5.

7. Claim 7, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gelb in view of Basham and further in view of Bergsten (U.S. Patent Application Publication Number 2003/0204672).

The apparatus of Gelb in view of Basham 1 does not explicitly teach the limitations: "a network", "coupled to a network", and "from the controller over the network".

Bergsten teaches the limitation:

"a network", "coupled to a network", and "from the controller over the network" (Figure 3: *Network Adapter 312* and Paragraphs 0032 and 0033). Bergsten teaches a system and means of an advanced storage controller which is attached to a network (Figure 3 and Paragraphs 0032 and 0033).

At the time the invention was made, it would have been obvious to person of ordinary skill in the art to add the feature of coupling a storage system controller to a network as taught by Bergsten to the system and apparatus of Gelb in view of Basham so that the resultant system would be a system for scaling a storage medium to improve data access performance, the system comprising:

"a network configured to communicate data" (Bergsten, Figure 3: *Network Adapter 312* and Paragraphs 0032-0033);

"a storage controller coupled to the network" (Bergsten, Figure 3: *Network Adapter 312* and *Advanced Storage Controller 100* and Paragraphs 0032-0033);

"a storage device having a storage medium configured to store data" (Gelb, Figure 4: *Peripheral Data Storage 12*) received from the controller over the network

(Bergsten, Figure 3: *Network Adapter 312* and *Advanced Storage Controller 100* and Paragraphs 0032-0033);

“a host coupled to the network” (Gelb, Figure 4: *host processor 10* and Column 15 Lines 51-67 and Bergsten, Figure 3: *Network Adapter 312* and Paragraphs 0032-0033), “the host configured to exchange data with the controller” (Bergsten, Figure 3: *Advanced Storage Controller 100* and Paragraphs 0032-0033);

“an application operating within the host, the application configured to produce a dataset to be stored on the storage medium” (Gelb, Figure 4: *Application Programs 30* and Column 15 Lines 51-67);

and “a scaling module configured to communicate with the application” (Gelb Figure 4: *Data Facility Product 32*, Figure 4: *Application Programs 30* and Column 15 Line s51-67) and “select a storage instruction in response to storage criteria applied to storage characteristics of the dataset” (Gelb, Column 12 Lines 43-61, i.e., *storage classes* and Column 18 Line 47 through Column 19 Line 15, i.e., *compare the information*), “wherein the storage instruction comprises an instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance” (Basham, Column 3 Lines 68-61, Column 11 Lines 25-30, Column 14 Lines 38-43, Column 14 Line 64 through Column 15 Line 6, and Column 15 Lines 16-39).

One would have been motivated to do so because network attached storage systems (NAS) is well known in the art and commonly implemented today.

Referring to claim 11, Gelb view of Basham and further in view of Bergsten teaches the limitation:

“wherein the storage controller is configured to receive the storage instruction and execute the storage instruction” (Bergsten, Figure 3: *Advanced Storage Controller 100* and Paragraphs 0032-0033).

Referring to claim 12, Gelb teaches the limitation:

“wherein the scaling module operates within the host” (Gelb, Figure 4: *host processor 10* and *Data Facility Product 32* and Column 15 Lines 51-67).

8. Claim 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gelb in view of Basham, further in view of Bergsten and further in view of Riedel et al. (hereinafter “Riedel”) (Erik Riedel, Garth Gibson and Christos Faloutsos, *Active Storage for Large-Scale Data Mining and Multimedia, Proceedings of the 24<sup>th</sup> VLDB Conference, New York, USA, 1998*).

Referring to claims 13, Gelb in view Basham and further in view of Bergsten does not explicitly teach the limitation: “wherein the scaling module operates within the storage controller”.

Riedel teaches the limitation:

““wherein the scaling module operates within the storage controller” (Page 1, Paragraph 2, Page 3 Figure 1, Column 1, and Paragraph 1 through Page 3 Column 2



Paragraph 1). Riedel teaches a system and method called *Active Storage* wherein application code is executed within the storage device controller/storage device (Page 1, Paragraph 2, i.e., *General purpose microcontrollers with 100-200 MHz processing speeds are already being incorporated into high-end commodity disk drives*; Page 3 Figure 1, i.e., *The Trend in Drive Electronics*; and Page 3, Column 1, Paragraph 1 through Page 3 Column 2 Paragraph 1, i.e., *With Active Disks, excess computation power in storage devices is available directly for application-specific function in addition to supporting these existing storage specific optimizations.* ).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to add the feature of exploiting the processing power of embedded microprocessors inside disk controller/disk to execute application code as taught by Riedel to the system of Gelb in view of Basham and further in view of Bergsten so that, in the resultant system, the scaling module would operate either within the storage controller or the storage device. One would have been motivated to do so in order to *exploit the processors embedded in individual storage device for some of the data-intensive applications common in data mining and multimedia databases* (Riedel et al., Page 1, Column 2, Line 2-6).

Referring to claim 14, Riedel teaches the limitation:

"wherein the scaling module operates within the magnetic tape storage device" (Page 1, Paragraph 2, Page 3 Figure 1, Column 1, and Paragraph 1 through Page 3 Column 2 Paragraph 1). Also refer to the action on claim 13 for this limitation.

### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

### **Contact Information**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Myint whose telephone number is (571) 272-5629. The examiner can normally be reached on 8:30 AM - 5:30 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dennis Myint

AU-2162



Cam y Truong  
primary Examiner